Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Original) A malfunction detection system for an internal combustion engine comprising:

an air fuel ratio detection section that detects the air fuel ratio of an exhaust gas of an internal combustion engine;

an EGR device that connects an intake system and an exhaust system of said internal combustion engine for recirculating a part of the exhaust gas to the intake system;

an exhaust gas air fuel ratio feedback control section that controls, in a feedback manner, the air fuel ratio of the exhaust gas to a predetermined air fuel ratio based on the air fuel ratio of the exhaust gas detected by said air fuel ratio detection section;

an intake air amount feedback control section that changes the amount of the exhaust gas recirculated by said EGR device in such a manner that the amount of fresh air sucked to said internal combustion engine is adjusted to a target amount;

a state value detection section that detects the state values of a plurality of items, respectively, related to a change in the air fuel ratio of the exhaust gas in individual operating states including when said engine is in a first operating state in which feedback control according to said exhaust gas air fuel ratio feedback control section is not performed but feedback control according to said intake air amount feedback control section is performed, and when said engine is in a second operating state in which both feedback control according to said exhaust gas air fuel ratio feedback control section and feedback control according to said intake air amount feedback control section are performed;

a first item identification section that identifies items whose state values detected by said state value detection section in said first operating state are outside of a normal value

range that is set with respect to the state value of each item in said first operating state;

a second item identification section that identifies items whose state values detected by said state value detection section in said second operating state are outside of a normal value range that is set with respect to the state value of each item in said second operating state; and

a malfunction item identification section that identifies which item is malfunction, from the items specified by said first item identification section and from the items identified by said second item identification section.

2. (Original) A malfunction detection system for an internal combustion engine comprising:

an air fuel ratio detection section that detects the air fuel ratio of an exhaust gas of an internal combustion engine;

an EGR device that connects an intake system and an exhaust system of said internal combustion engine for recirculating a part of the exhaust gas to the intake system;

an exhaust gas air fuel ratio feedback control section that controls, in a feedback manner, the air fuel ratio of the exhaust gas to a predetermined air fuel ratio based on the air fuel ratio of the exhaust gas detected by said air fuel ratio detection section;

an intake air amount feedback control section that changes the amount of the exhaust gas recirculated by said EGR device in such a manner that the amount of fresh air sucked to said internal combustion engine is adjusted to a target amount;

a first state value detection section that detects the state values of a plurality of items, respectively, related to a change in the air fuel ratio of the exhaust gas in a first operating state in which feedback control according to said exhaust gas air fuel ratio feedback control section is not performed but feedback control according to said intake air amount feedback control section is performed;

a first item identification section that identifies items whose state values detected by said state value detection section in said first operating state are outside of a normal value range that is set with respect to the state value of each item in said first operating state;

an exhaust gas air fuel ratio variation section that makes the air fuel ratio of the exhaust gas vary when there are two or more items identified by said first item identification section;

a second state value detection section that detects the state values of a plurality of items, respectively, related to a change in the air fuel ratio of the exhaust gas in a second operating state in which feedback control according to said exhaust gas air fuel ratio feedback control section and feedback control according to said intake air amount feedback control section are performed, after the air fuel ratio of the exhaust gas is made to vary by said exhaust gas air fuel ratio variation section;

a second item identification section that identifies items whose state values detected by said second state value detection section in said second operating state are outside of a normal value range that is set with respect to the state value of each item in said second operating state; and

a malfunction item identification section that identifies which item is malfunction, from the items specified by said first item identification section and from the items identified by said second item identification section.

3. (Original) A malfunction detection system for an internal combustion engine comprising:

an air fuel ratio sensor that detects the air fuel ratio of an exhaust gas of an internal combustion engine;

an intake air amount detection device that detects the amount of fresh air sucked to said internal combustion engine;

a fuel injection valve that supplies fuel to a cylinder of said internal combustion engine;

an exhaust gas temperature sensor that detects the temperature of the exhaust gas of said internal combustion engine;

a fuel addition valve that adds fuel to an exhaust passage at a location upstream of said air fuel ratio sensor and said exhaust gas temperature sensor;

a fuel addition amount feedback control section that changes the amount of fuel to be added from said fuel addition valve so as to adjust the air fuel ratio of the exhaust gas detected by said air fuel ratio sensor to a target air fuel ratio when fuel is added from said fuel addition valve;

an EGR device that connects an intake system and an exhaust system of said internal combustion engine for recirculating a part of the exhaust gas to the intake system;

an intake air amount feedback control section that changes the amount of the exhaust gas recirculated by said EGR device in such a manner that the amount of fresh air detected by said intake air amount detection device is adjusted to a target amount;

a lean-time air fuel ratio difference calculation section that determines whether a difference between the air fuel ratio detected by said air fuel ratio sensor and said reference lean air fuel ratio is greater than or equal to a first predetermined value when feedback control according to said intake air amount feedback control section is performed but feedback control according to said fuel addition amount feedback control section is not performed, with said internal combustion engine being operated to achieve a reference lean air fuel ratio set as a target;

a lean-time exhaust gas temperature difference calculation section that determines whether a difference between the exhaust gas temperature detected by said exhaust gas temperature sensor and a reference exhaust gas temperature at this time is greater than or

equal to a second predetermined value when feedback control according to said intake air amount feedback control section is performed but feedback control according to said fuel addition amount feedback control section is not performed, with said internal combustion engine being operated to achieve a reference lean air fuel ratio set as a target; and

a rich-time exhaust gas temperature difference calculation section that determines whether a difference between the exhaust gas temperature, which is detected by said exhaust gas temperature sensor when the addition of fuel from said fuel addition valve, feedback control according to said fuel addition amount feedback control section and feedback control according to said intake air amount feedback control section are performed in such a manner that the air fuel ratio detected by said air fuel ratio sensor is adjusted to a reference rich air fuel ratio, and a reference exhaust gas temperature at this time is greater than or equal to a third predetermined value;

wherein when it is determined by said lean-time air fuel ratio calculation section that the difference between the air fuel ratio detected by said air fuel ratio sensor and said reference lean air fuel ratio is greater than or equal to a first predetermined value, and when it is determined by said lean-time exhaust gas temperature difference calculation section that the difference between the exhaust gas temperature detected by said exhaust gas temperature sensor and a reference exhaust gas temperature at this time is less than said second predetermined value, it is specified that malfunction occurs in said air fuel ratio sensor;

when it is determined by said lean-time air fuel ratio difference calculation section that the difference between the air fuel ratio detected by said air fuel ratio sensor and said reference lean air fuel ratio is less than the first predetermined value, and when it is determined by said lean-time exhaust gas temperature difference calculation section that the difference between the exhaust gas temperature detected by said exhaust gas temperature sensor and the reference exhaust gas temperature at this time is greater than or equal to the

second predetermined value, it is specified that malfunction occurs in said exhaust gas temperature sensor;

when it is determined by said lean-time air fuel ratio difference calculation section that the difference between the air fuel ratio detected by said air fuel ratio sensor and said reference lean air fuel ratio is greater than or equal to the first predetermined value, and when it is determined by said lean-time exhaust gas temperature difference calculation section that the difference between the exhaust gas temperature detected by said exhaust gas temperature sensor and the reference exhaust gas temperature at this time is greater than or equal to the second predetermined value, and further when it is determined by said rich-time exhaust gas temperature difference calculation section that the difference between the exhaust gas temperature detected by said exhaust gas temperature sensor and the reference exhaust gas temperature at this time is less than the third predetermined value, it is specified that malfunction occurs in the amount of injection of said fuel injection valve; and

when it is determined by said lean-time air fuel ratio calculation section that the difference between the air fuel ratio detected by said air fuel ratio sensor and said reference lean air fuel ratio is greater than or equal to a first predetermined value, and when it is determined by said lean-time exhaust gas temperature difference calculation section that the difference between the exhaust gas temperature detected by said exhaust gas temperature sensor and the reference exhaust gas temperature at this time is greater than or equal to the second predetermined value, and further when it is determined by said rich-time exhaust gas temperature difference calculation section that the difference between the exhaust gas temperature detected by said exhaust gas temperature sensor and the reference exhaust gas temperature at this time is greater than or equal to the third predetermined value, it is specified that there is malfunction in said intake air amount detection device.

4. (Original) A malfunction detection system for an internal combustion engine

comprising:

an air fuel ratio sensor that detects the air fuel ratio of an exhaust gas of an internal combustion engine;

an intake air amount detection device that detects the amount of fresh air sucked to said internal combustion engine;

a fuel injection valve that supplies fuel to a cylinder of said internal combustion engine;

an exhaust gas temperature sensor that detects the temperature of the exhaust gas of said internal combustion engine;

an EGR device that connects an intake system and an exhaust system of said internal combustion engine for recirculating a part of the exhaust gas to the intake system;

an intake air amount feedback control section that changes the amount of the exhaust gas recirculated by said EGR device in such a manner that the amount of fresh air detected by said intake air amount detection device is adjusted to a target amount;

a lean-time air fuel ratio difference calculation section that determines whether a difference between the air fuel ratio detected by said air fuel ratio sensor and a reference lean air fuel ratio is greater than or equal to a first predetermined value when feedback control according to said intake air amount feedback control section is performed, and when said internal combustion engine is operated to achieve the reference lean air fuel ratio as a target;

a lean-time exhaust gas temperature difference calculation section that determines a difference between the exhaust gas temperature detected by said exhaust gas temperature sensor and a reference exhaust gas temperature at this time is greater than or equal to a second predetermined value when feedback control according to said intake air amount feedback control section is performed, and when said internal combustion engine is operated to achieve the reference lean air fuel ratio as a target;

a fuel addition valve that adds fuel to an exhaust passage at a location upstream of said air fuel ratio sensor and said exhaust gas temperature sensor when it is determined by said lean-time air fuel ratio difference calculation section that the difference between the air fuel ratio detected by said air fuel ratio sensor and said reference lean air fuel ratio is greater than or equal to the first predetermined value, and when it is determined by said lean-time exhaust gas temperature difference calculation section that the difference between the exhaust gas temperature detected by said exhaust gas temperature sensor and the reference exhaust gas temperature at this time is greater than or equal to the second predetermined value;

a fuel addition amount feedback control section that changes the amount of fuel to be added from said fuel addition valve so as to adjust the air fuel ratio of the exhaust gas detected by said air fuel ratio sensor to a reference rich air fuel ratio when fuel is added from said fuel addition valve; and

a rich-time exhaust gas temperature difference calculation section that determines whether a difference between the exhaust gas temperature, which is detected by said exhaust gas temperature sensor when the addition of fuel from said fuel addition valve, feedback control according to said fuel addition amount feedback control section and feedback control according to said intake air amount feedback control section are performed, and a reference exhaust gas temperature at this time is greater than or equal to a third predetermined value;

wherein when it is determined by said lean-time air fuel ratio calculation section that the difference between the air fuel ratio detected by said air fuel ratio sensor and said reference lean air fuel ratio is greater than or equal to a first predetermined value, and when it is determined by said lean-time exhaust gas temperature difference calculation section that the difference between the exhaust gas temperature detected by said exhaust gas temperature sensor and the reference exhaust gas temperature at this time is less than the second predetermined value, it is specified that malfunction occurs in said air fuel ratio sensor;

when it is determined by said lean-time air fuel ratio difference calculation section that the difference between the air fuel ratio detected by said air fuel ratio sensor and said reference lean air fuel ratio is less than the first predetermined value, and when it is determined by said lean-time exhaust gas temperature difference calculation section that the difference between the exhaust gas temperature detected by said exhaust gas temperature sensor and the reference exhaust gas temperature at this time is greater than or equal to the second predetermined value, it is specified that malfunction occurs in said exhaust gas temperature sensor;

when it is determined by said rich-time exhaust gas temperature difference calculation section that the difference between the exhaust gas temperature detected by said exhaust gas temperature sensor and the reference exhaust gas temperature at this time is less than the third predetermined value, it is specified that malfunction occurs in the amount of injection of said fuel injection valve; and

when it is determined by said rich-time exhaust gas temperature difference calculation section that the difference between the exhaust gas temperature detected by said exhaust gas temperature sensor and the reference exhaust gas temperature at this time is greater than or equal to the third predetermined value, it is specified that there is malfunction in said intake air amount detection device.

5. (Currently Amended) The malfunction detection system for an internal combustion engine as set forth in claim 3~~ or 4~~, wherein a plurality of said air fuel ratio sensors are provided, and a final determination section is further provided that finalizes a malfunction determination of one air fuel ratio sensor in which malfunction is assumed to occur, when it is determined that malfunction occurs in one air fuel ratio sensor, and when a difference between a detected value of the one air fuel ratio sensor, in which malfunction is assumed to occur, and a detected value of another air fuel ratio sensor is greater than or equal to a

predetermined value.

6. (New) The malfunction detection system for an internal combustion engine as set forth in claim 4, wherein a plurality of said air fuel ratio sensors are provided, and a final determination section is further provided that finalizes a malfunction determination of one air fuel ratio sensor in which malfunction is assumed to occur, when it is determined that malfunction occurs in one air fuel ratio sensor, and when a difference between a detected value of the one air fuel ratio sensor, in which malfunction is assumed to occur, and a detected value of another air fuel ratio sensor is greater than or equal to a predetermined value.